Math Diversion 1070

P. Reany

April 14, 2026

It is clear that the chief end of mathematical study
must be to make the students think.
— John Wesley Young
(So think!)

```
Source: ?
Title: More Logarithms
 Presenter: Interesting Math
```

1 Problem

Given the relation

$$\frac{80}{8^x} = 8^x \,, \tag{1}$$

solve for real values of x.

2 Solution

The Given can be rewritten as

$$8 \times 10 = 8^{2x} \,, \tag{2}$$

which becomes

$$8^{2x-1} = 10 \,. \tag{3}$$

After taking the logarithm base 10, we get

$$(2x-1)\log_{10} 8 = 1 \,. \tag{4}$$

And this becomes

$$2x - 1 = \frac{1}{\log_{10} 8} \,. \tag{5}$$

And finally,

$$x = \frac{1}{2}\left[\frac{1}{\log_{10} 8} + 1\right] \,. \tag{6}$$